Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

1. (original) A notch filter, comprising:

a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase; and

a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

2. (original) The notch filter of claim 1 wherein the first polyphase filter is adapted to receive the input signal, the input signal being differential, the first polyphase filter further being adapted to output a quadrature signal having an in-phase and quadrature component and an inverted quadrature signal having an inverted in-phase and inverted quadrature component, the first phase comprising one of the components of the quadrature signal and the inverted first phase comprising one of the components of the inverted quadrature signal.

3. (original) The notch filter of claim 2 wherein the first phase comprises the quadrature component and the inverted first phase comprises the inverted quadrature component.

4. (original) The notch filter of claim 2 wherein the first polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at a particular frequency, the first polyphase filter outputting the quadrature signal when the input signal has a frequency at the particular frequency.

5. (original) The notch filter of claim 4 wherein the second polyphase filter comprises a plurality of resistors and capacitors arranged in a second polyphase structure to reject the quadrature signal at the particular frequency.

6. (original) The notch filter of claim 5 wherein the particular frequency is an odd harmonic of the input signal.

7. (original) The notch filter of claim 6 wherein the particular frequency is a third harmonic of the input signal.

8. (original) The notch filter of claim 1 wherein the first polyphase filter comprises first, second, third and fourth inputs adapted to receive the input signal, the input signal being differential, the first and fourth inputs being coupled together to receive a first one of the differential input signals and the second and third inputs being coupled together to receive a second one of the differential input signals.

9. (original) The notch filter of claim 8 wherein the first polyphase filter further comprises a first resistor having a first end coupled to the first input, a first capacitor having a first end coupled to the first input, a second capacitor having a first end coupled to the second input and a second end coupled to a second end of the first resistor to form a first output, a second resistor having a first end coupled to the second input, a third capacitor having a first end coupled to the third input and a second end coupled to a second end of the second resistor to form a second output, a third resistor having a first end coupled to the third input, a fourth capacitor having a first end coupled to the fourth input and a second end coupled to a second end of the third resistor to form a third output, and a fourth resistor having a first end coupled to the fourth input and a second end coupled to a second end of the first capacitor to form a fourth output.

10. (original) The notch filter of claim 9 wherein the second output comprises the first phase and the fourth output comprises the inverted first phase.

11. (original) The notch filter of claim 10 wherein the second polyphase filter comprises fifth, sixth, seventh and eighth inputs, a fifth resistor having a first end coupled to the fifth input, a

fifth capacitor having a first end coupled to the fifth input, a sixth capacitor having a first end coupled to the sixth input and a second end coupled to a second end of the fifth resistor, a sixth resistor having a first end coupled to the sixth input, a seventh capacitor having a first end coupled to the seventh input and a second end coupled to a second end of the sixth resistor, a seventh resistor having a first end coupled to the seventh input, a eighth capacitor having a first end coupled to the eighth input and a second end coupled to a second end of the seventh resistor to form a seventh output, and a eighth resistor having a first end coupled to the eighth input and a second end coupled to a second end of the first capacitor to form a eighth output, and wherein the second output of the first polyphase filter is coupled to the eighth input of the second polyphase filter and the fourth output of the first polyphase filter is coupled to the sixth input of the second polyphase filter.

12. (original) A notch filter, comprising:

a first polyphase filter including an input, and an output having a non-inverted output and an inverted output; and

a second polyphase filter having an input comprising a non-inverted and inverted input, the non-inverted output of the first polyphase filter being coupled to the inverted input of the second polyphase filter and the inverted output of the first polyphase filter being coupled to the non-inverted input of the second polyphase filter.

13. (original) The notch filter of claim 12 wherein the input to the first polyphase filter comprises a differential input.

14. (original) The notch filter of claim 13 wherein the input to the first polyphase filter comprises an in-phase input, an inverted in-phase input, a quadrature input and an inverted quadrature input, the in-phase input being coupled to the inverted quadrature input to receive a first one of differential signals, and the quadrature input being coupled to the inverted in-phase input to receive a second one of the differential signals.

15. (original) The notch filter of claim 12 wherein the first polyphase filter comprises an in-phase output, a quadrature output, an inverted in-phase output and an inverted quadrature output, the non-inverted output of the first polyphase filter comprising one of the in-phase and quadrature outputs, and the inverted output of the first polyphase filter comprising one of the inverted in-phase or inverted quadrature outputs.

16. (original) The notch filter of claim 15 wherein the non-inverted output of the first polyphase filter comprises the quadrature output and the inverted output of the first polyphase filter comprises the inverted quadrature output.

17. (original) The notch filter of claim 12 wherein the input to the first polyphase filter comprises first, second, third and fourth inputs, the first and fourth inputs being coupled together to receive the first one of the differential signals and the second and third inputs being coupled together to receive the second one of the differential input signals.

18. (original) The notch filter of claim 17 wherein the output of the first polyphase filter comprises first, second, third and fourth outputs, the first polyphase filter further comprising a first resistor having a first end coupled to the first input, a first capacitor having a first end coupled to the first input, a second capacitor having a first end coupled to the second input and a second end coupled to a second end of the first resistor to form the first output, a second resistor having a first end coupled to the second input, a third capacitor having a first end coupled to the third input and a second end coupled to a second end of the second resistor to form the second output, a third resistor having a first end coupled to the third input, a fourth capacitor having a first end coupled to the fourth input and a second end coupled to a second end of the third resistor to form the third output, and a fourth resistor having a first end coupled to the fourth input and a second end coupled to a second end of the first capacitor to form the fourth output, the non-inverted output of the first polyphase filter comprising the second output and the inverted output of the first polyphase circuit comprising the fourth output.

19. (original) The notch filter of claim 18 wherein the input of the second polyphase filter comprises fifth, sixth, seventh and eighth inputs, the second polyphase filter further comprising a fifth resistor having a first end coupled to the fifth input, a fifth capacitor having a first end coupled to the fifth input, a sixth capacitor having a first end coupled to the sixth input and a second end coupled to a second end of the fifth resistor, a sixth resistor having a first end coupled to the sixth input, a seventh capacitor having a first end coupled to the seventh input and a second end coupled to a second end of the sixth resistor, a seventh resistor having a first end coupled to the seventh input, a eighth capacitor having a first end coupled to the eighth input and a second end coupled to a second end of the seventh resistor to form a seventh output, and a eighth resistor having a first end coupled to the eighth input and a second end coupled to a second end of the first capacitor to form a eighth output, the sixth input comprising the non-inverted input to the second polyphase filter and the eighth input comprising the inverted input to the second polyphase circuit.

20. (original) A notch filter, comprising:

generating means for generating an output signal comprising a plurality of phases of an input signal; and

notching means for notching a particular frequency of the input signal as a function of the phases.

21. (original) The notch filter of claim 20 wherein the input signal comprises a differential signal.

22. (original) The notch filter of claim 20 wherein the generating means further comprises means for generating the output signal with quadrature outputs when the input signal includes the particular frequency.

23. (original) The notch filter of claim 22 wherein the notching means comprising means

for rejecting the quadrature signal at the particular frequency.

24. (original) The notch filter of claim 23 wherein the particular frequency is an odd harmonic of the input signal.

25. (original) The notch filter of claim 24 wherein the particular frequency is a third harmonic of the input signal.

Claims 26-30 (Cancelled).

31. (original) A circuit, comprising:

a mixer having an output including a mixed signal output and an inverted mixed signal output; and

a polyphase filter having an input including a non-inverted input coupled to the inverted mixed signal output, and an inverted input coupled to the non-inverted mixed signal output.

32. (original) The circuit of claim 31 wherein the mixer output comprises an in-phase component, an inverted in-phase component, a quadrature component and an inverted quadrature component, the mixed signal output comprising one of the in-phase and quadrature components, and the inverted mixed signal output comprising one of the inverted in-phase and inverted quadrature components.

33. (original) The circuit of claim 32 wherein the mixed signal output comprises the quadrature component and the inverted mixed signal output comprises the inverted quadrature component.

34. (original) The circuit of claim 31 wherein the polyphase filter comprises an output having a notch at a particular frequency.

35. (original) The circuit of claim 34 wherein the polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at the particular frequency

36. (original) The circuit of claim 31 wherein the input of the polyphase filter comprises first, second, third and fourth inputs, the polyphase filter further comprising a first resistor having a first end coupled to the first input, a first capacitor having a first end coupled to the first input, a second capacitor having a first end coupled to the second input and a second end coupled to a second end of the first resistor to form a first output, a second resistor having a first end coupled to the second input, a third capacitor having a first end coupled to the third input and a second end coupled to a second end of the second resistor to form a second output, a third resistor having a first end coupled to the third input, a fourth capacitor having a first end coupled to the fourth input and a second end coupled to a second end of the third resistor to form a third output, and a fourth resistor having a first end coupled to the fourth input and a second end coupled to a second end of the first capacitor to form a fourth output, the second input comprising the non-inverted input and the fourth input comprising the inverted input.

37. (original) The circuit of claim 31 further comprising a second polyphase filter having an input comprising a non-inverted and inverted input, the polyphase filter having an output comprising a non-inverted output coupled to the inverted input of the second polyphase filter and an inverted output coupled to the non-inverted input of the second polyphase filter.

38. (original) The circuit of claim 37 wherein the mixer output comprises an in-phase component, an inverted in-phase component, a quadrature component and an inverted quadrature component, the mixed signal output comprising one of the in-phase and quadrature components, and the inverted mixed signal output comprising one of the inverted in-phase and inverted quadrature components.

39. (original) The circuit of claim 38 wherein the polyphase output comprises an in-phase component, an inverted in-phase component, a quadrature component and an inverted quadrature component, the non-inverted output of the polyphase filter comprising one of the in-phase and quadrature components, and the inverted output of the polyphase filter comprising one of the inverted in-phase and inverted quadrature components.

40. (original) The circuit of claim 39 wherein the mixed signal output comprises the quadrature component of the mixer, the inverted mixed signal output comprises the inverted quadrature component of the mixer, the non-inverted output of the polyphase filter comprises the quadrature component of the polyphase filter, and the inverted output of the polyphase filter comprises the inverted quadrature component of the polyphase filter.

41. (original) The circuit of claim 37 wherein the polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at a first frequency, and the second polyphase filter comprises a plurality of second resistor and capacitors arranged in a second polyphase structure to generate a zero at a second frequency different from the first frequency.

42. (original) The circuit of claim 41 wherein the output of the polyphase filter comprises a notch at the first frequency, and the second polyphase filter comprises an output having a first notch at the first frequency and a second notch at the second frequency.

43. (original) The circuit of claim 42 further comprising a third filter having an input coupled to the output of the second polyphase filter, the third filter attenuating frequencies above a third frequency higher than the first and second frequencies.

44. (original) The circuit of claim 37 wherein the input of the polyphase filter comprises first, second, third and fourth inputs, the polyphase filter further comprising a first resistor having a

first end coupled to the first input, a first capacitor having a first end coupled to the first input, a second capacitor having a first end coupled to the second input and a second end coupled to a second end of the first resistor to form a first output, a second resistor having a first end coupled to the second input, a third capacitor having a first end coupled to the third input and a second end coupled to a second end of the second resistor to form a second output, a third resistor having a first end coupled to the third input, a fourth capacitor having a first end coupled to the fourth input and a second end coupled to a second end of the third resistor to form a third output, and a fourth resistor having a first end coupled to the fourth input and a second end coupled to a second end of the first capacitor to form a fourth output, the second input comprising the non-inverted input and the fourth input comprising the inverted input.

45. (original) The circuit of claim 44 wherein the input of the second polyphase filter comprises fifth, sixth, seventh and eighth inputs, the second polyphase filter further comprising a fifth resistor having a first end coupled to the fifth input, a fifth capacitor having a first end coupled to the fifth input, a sixth capacitor having a first end coupled to the sixth input and a second end coupled to a second end of the fifth resistor, a sixth resistor having a first end coupled to the sixth input, a seventh capacitor having a first end coupled to the seventh input and a second end coupled to a second end of the sixth resistor, a seventh resistor having a first end coupled to the seventh input, a eighth capacitor having a first end coupled to the eighth input and a second end coupled to a second end of the seventh resistor to form a seventh output, and a eighth resistor having a first end coupled to the eighth input and a second end coupled to a second end of the first capacitor to form a eighth output, the sixth input comprising the non-inverted input to the second polyphase filter and the eighth input comprising the inverted input to the second polyphase circuit.

46. (previously presented) A circuit, comprising:

a first polyphase filter having an output including a non-inverted output and an inverted output; and

a second polyphase filter having an input including a non-inverted input coupled to the

inverted output of the first polyphase filter and an inverted input coupled to the non-inverted output of the first polyphase filter.

47. (original) The circuit of claim 46 wherein the output of the first polyphase filter comprises an in-phase component, an inverted in-phase component, a quadrature component and an inverted quadrature component, the non-inverted output of the first polyphase filter comprising one of the in-phase and quadrature components, and the inverted output of the first polyphase filter comprising one of the inverted in-phase and inverted quadrature components.

48. (previously presented) The circuit of claim 47 wherein the non-inverted output of the first polyphase filter comprises the quadrature component of the first polyphase filter, and the inverted output of the first polyphase device comprises the inverted quadrature component of the first polyphase filter.

49. (original) The circuit of claim 46 wherein the first polyphase filter comprises a plurality of first resistors and capacitors arranged in a polyphase structure to generate a zero at a first frequency, and the second polyphase filter comprises a plurality of second resistor and capacitors arranged in a second polyphase structure to generate a zero at a second frequency different from the first frequency.

50. (original) The circuit of claim 49 wherein the output of the first polyphase filter comprises a notch at the first frequency, and the second polyphase filter comprises an output having a first notch at the first frequency and a second notch at the second frequency.

51. (original) The circuit of claim 50 further comprising a third filter having an input coupled to the output of the second polyphase filter, the third filter attenuating frequencies above a third frequency, the third frequency being higher than the first and second frequencies.

52. (original) The circuit of claim 46 wherein the input of the first polyphase filter comprises first, second, third and fourth inputs, the first polyphase filter further comprising a first resistor having a first end coupled to the first input, a first capacitor having a first end coupled to the first input, a second capacitor having a first end coupled to the second input and a second end coupled to a second end of the first resistor to form a first output, a second resistor having a first end coupled to the second input, a third capacitor having a first end coupled to the third input and a second end coupled to a second end of the second resistor to form a second output, a third resistor having a first end coupled to the third input, a fourth capacitor having a first end coupled to the fourth input and a second end coupled to a second end of the third resistor to form a third output, and a fourth resistor having a first end coupled to the fourth input and a second end coupled to a second end of the first capacitor to form a fourth output, the second input comprising the non-inverted input and the fourth input comprising the inverted input.

53. (original) The circuit of claim 52 wherein the input of the second polyphase filter comprises fifth, sixth, seventh and eighth inputs, the second polyphase filter further comprising a fifth resistor having a first end coupled to the fifth input, a fifth capacitor having a first end coupled to the fifth input, a sixth capacitor having a first end coupled to the sixth input and a second end coupled to a second end of the fifth resistor, a sixth resistor having a first end coupled to the sixth input, a seventh capacitor having a first end coupled to the seventh input and a second end coupled to a second end of the sixth resistor, a seventh resistor having a first end coupled to the seventh input, a eighth capacitor having a first end coupled to the eighth input and a second end coupled to a second end of the seventh resistor to form a seventh output, and a eighth resistor having a first end coupled to the eighth input and a second end coupled to a second end of the first capacitor to form a eighth output, the sixth input comprising the non-inverted input to the second polyphase filter and the eighth input comprising the inverted input to the second polyphase filter.

Claims 54-66 (Cancelled).

67. (New) A wireless communications transceiver, comprising:

a transmitter and a receiver that support spread spectrum wireless communications; and

a local oscillator generator operatively coupled to the transmitter and to the receiver,

wherein the local oscillator generator comprises a notch filter,

wherein the notch filter comprises a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase, and

wherein the notch filter comprises a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

68. (New) The wireless communications transceiver according to claim 67, wherein the notch filter is part of a clock generator of the local oscillator generator.

69. (New) The wireless communications transceiver according to claim 68, wherein the notch filter is configured to notch multiple harmonic frequencies.

70. (New) The wireless communications transceiver according to claim 68, wherein the clock generator comprises a low pass filter that is operatively coupled to the notch filter.

71. (New) The wireless communications transceiver according to claim 67, wherein the transmitter and the receiver are integrated on a single integrated circuit chip.

72. (New) The wireless communications transceiver according to claim 71, wherein the single integrated circuit chip employs at least complementary metal oxide semiconductor (CMOS) technology.

73. (New) The wireless communications transceiver according to claim 67, wherein the wireless communications transceiver is part of a wireless communications device that performs frequency hopping.

74. (New) The wireless communications transceiver according to claim 67, wherein the wireless communications transceiver is part of a wireless communications device that performs direct sequence spread spectrum modulation.

75. (New) The wireless communications transceiver according to claim 67, wherein the wireless communications transceiver is part of a wireless communications device that performs orthogonal frequency division modulation.

76. (New) The wireless communications transceiver according to claim 67, wherein the first polyphase filter is adapted to receive the input signal, the input signal being differential, the first polyphase filter further being adapted to output a quadrature signal having an in-phase and quadrature component and an inverted quadrature signal having an inverted in-phase and inverted quadrature component, the first phase comprising one of the components of the quadrature signal and the inverted first phase comprising one of the components of the inverted quadrature signal.

77. (New) The wireless communications transceiver according to claim 76, wherein the first phase comprises the quadrature component and the inverted first phase comprises the inverted quadrature component.

78. (New) The wireless communications transceiver according to claim 76, wherein the first polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at a particular frequency, the first polyphase filter outputting the quadrature signal when the input signal has a frequency at the particular frequency.

79. (New) The wireless communications transceiver according to claim 78, wherein the second polyphase filter comprises a plurality of resistors and capacitors arranged in a second polyphase structure to reject the quadrature signal at the particular frequency.

80. (New) The wireless communications transceiver according to claim 79, wherein the particular frequency is an odd harmonic of the input signal.

81. (New) The wireless communications transceiver according to claim 80, wherein the particular frequency is a third harmonic of the input signal.

82. (New) The wireless communications transceiver according to claim 67, wherein the notch filter is programmable.

83. (New) The wireless communications transceiver according to claim 67, wherein the wireless communications transceiver is part of a wireless communications device that performs Bluetooth communications.

84. (New) The wireless communications transceiver according to claim 67, wherein the wireless communications transceiver is part of a wireless communications device that performs wireless local area network communications.

85. (New) A wireless communications device, comprising:

a transmitter and a receiver that are integrated on a single integrated circuit chip, the single integrated circuit chip employing at least complementary metal oxide semiconductor (CMOS) technology;

wherein the single integrated circuit chip comprises a notch filter,

wherein the notch filter comprises a first polyphase filter to output a plurality of phases of an input signal including a first phase and an inverted first phase, and

wherein the notch filter comprises a second polyphase filter having an input to receive the inverted first phase and an inverted input to receive the first phase.

86. (New) The wireless communications device according to claim 85, wherein the notch filter is part of a local oscillator generator.

87. (New) The wireless communications device according to claim 85, wherein the notch filter is part of the receiver.

88. (New) The wireless communications device according to claim 85, wherein the notch filter is configured to notch multiple harmonic frequencies.

89. (New) The wireless communications device according to claim 85, wherein the wireless communications device performs spread spectrum modulation.

90. (New) The wireless communications device according to claim 85, wherein the wireless communications device performs frequency hopping.

91. (New) The wireless communications device according to claim 85, wherein the wireless communications transceiver is part of a wireless communications device that performs Bluetooth communications.

92. (New) The wireless communications device according to claim 85, wherein the wireless communications transceiver is part of a wireless communications device that performs wireless local area network communications.

93. (New) The wireless communications device according to claim 85, wherein the wireless communications device performs direct sequence spread spectrum modulation.

94. (New) The wireless communications device according to claim 85, wherein the wireless communications device performs orthogonal frequency division modulation.

95. (New) The wireless communications device according to claim 85, wherein the notch filter is programmable.

96. (New) The wireless communications device according to claim 85, wherein the first polyphase filter is adapted to receive the input signal, the input signal being differential, the first polyphase filter further being adapted to output a quadrature signal having an in-phase and quadrature component and an inverted quadrature signal having an inverted in-phase and inverted quadrature component, the first phase comprising one of the components of the quadrature signal and the inverted first phase comprising one of the components of the inverted quadrature signal.

97. (New) The wireless communications device according to claim 96, wherein the first phase comprises the quadrature component and the inverted first phase comprises the inverted quadrature component.

98. (New) The wireless communications device according to claim 96, wherein the first polyphase filter comprises a plurality of resistors and capacitors arranged in a polyphase structure to generate a zero at a particular frequency, the first polyphase filter outputting the quadrature signal when the input signal has a frequency at the particular frequency.

99. (New) The wireless communications device according to claim 98, wherein the second polyphase filter comprises a plurality of resistors and capacitors arranged in a second polyphase structure to reject the quadrature signal at the particular frequency.

100. (New) The wireless communications device according to claim 99, wherein the particular frequency is an odd harmonic of the input signal.

101. (New) The wireless communications device according to claim 100, wherein the

particular frequency is a third harmonic of the input signal.

102. (New) The notch filter according to claim 1, wherein the notch filter is part of a wireless communications device that supports spread spectrum wireless communications, and wherein the wireless communications device employs at least complementary metal oxide semiconductor (CMOS) technology.

103. (New) The notch filter according to claim 102, wherein the wireless communications device comprises a transmitter and a receiver that are integrated on a single integrated circuit chip.

104. (New) The notch filter according to claim 12, wherein the notch filter is part of a wireless communications device that supports spread spectrum wireless communications, and wherein the wireless communications device employs at least complementary metal oxide semiconductor (CMOS) technology.

105. (New) The notch filter according to claim 104, wherein the wireless communications device comprises a transmitter and a receiver that are integrated on a single integrated circuit chip.

106. (New) The notch filter according to claim 20, wherein the notch filter is part of a wireless communications device that supports spread spectrum wireless communications, and wherein the wireless communications device employs at least complementary metal oxide semiconductor (CMOS) technology.

107. (New) The notch filter according to claim 106, wherein the wireless communications device comprises a transmitter and a receiver that are integrated on a single integrated circuit chip.

108. (New) The circuit according to claim 31, wherein the circuit is part of a wireless communications device that supports spread spectrum wireless communications, and wherein the

wireless communications device employs at least complementary metal oxide semiconductor (CMOS) technology.

109. (New) The circuit according to claim 108, wherein the wireless communications device comprises a transmitter and a receiver that are integrated on a single integrated circuit chip.

110. (New) The circuit according to claim 46, wherein the circuit is part of a wireless communications device that supports spread spectrum wireless communications, and wherein the wireless communications device employs at least complementary metal oxide semiconductor (CMOS) technology.

111. (New) The circuit according to claim 110, wherein the wireless communications device comprises a transmitter and a receiver that are integrated on a single integrated circuit chip.